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ANNUAL REPORT
OF THE
EASTERN ROCKIES FOREST
CONSERVATION BOARD
FOR THE
FISCAL YEAR
1966-67

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EASTERN ROCKIES FOREST CONSERVATION BOARD

514 - 11 Ave. S. W.

Calgary, Alberta

ANNUAL REPORT

of the

EASTERN ROCKIES FOREST CONSERVATION BOARD

for the

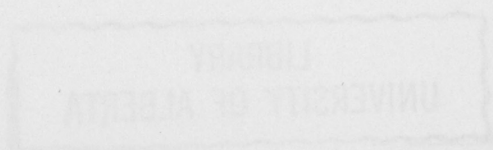
FISCAL YEAR

1966-67

CALGARY, Alberta

March 31, 1967

J. R. H. Hall
Chairman



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EASTERN ROCKIES FOREST CONSERVATION BOARD
514 - 11 Ave. S. W.
Calgary, Alberta

June 15, 1967

The Honourable Maurice Sauve
Minister of Forestry and Rural
Development
Ottawa, Ontario

Sir

I have the honour to submit herewith the Annual Report of the Eastern Rockies Forest Conservation Board for the fiscal period April 1, 1966 to March 31, 1967, pursuant to the provisions of the Eastern Rocky Mountain Forest Conservation Act of 1947. I am

Your obedient servant

J.R.H. Hall
Chairman

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June 15, 1967

The Honourable Henry A. Ruste
Minister of Lands and Forests
Edmonton, Alberta

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Chairman

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INTRODUCTION

EASTERN ROCKIES FOREST CONSERVATION BOARD

BOARD MEMBERS

Chairman and Provincial Member	J.R.H. Hall
Provincial Member	A.T. Baker, B.A.
Federal Member	J.D.B. Harrison, D.C.M., M.Sc.F.,LLD.

PRINCIPAL OFFICERS

Chief Forester	W.R. Hanson, B.Sc., M.S.
Secretary	J.M. Marshall

INTRODUCTION

Under the terms of the Eastern Rocky Mountain Forest Conservation Act and the Agreement between the Government of Canada and the Government of the Province of Alberta, the Board's responsibilities and duties as set out in the Act are to set policy, to plan programs for the protection and conservation of the forest resources, supervise the execution of the programs, and arrange for the undertaking of scientific investigations.

The Province of Alberta is authorized to carry out, under the direction of the Board, all administration and execution of the prescribed programs. These responsibilities have been fulfilled by the Alberta Forest Service in a most efficient manner, and the cooperation and assistance extended to the staff of the Board are gratefully acknowledged.

The watershed research program, carried out by a Technical Coordinating Committee under the direction of a steering committee based in Ottawa, has now completed its fourth year. The activities of the Technical Coordinating Committee, comprising twelve agencies of the Governments of Canada and Alberta, are reported on briefly in this report. A complete outline of the accomplishments to date of this group is contained in the Fourth Annual Report of the "East Slopes (Alberta) Watershed Research Program", copies of which may be obtained from the Secretary of the Eastern Rockies Forest Conservation Board, 514 - 11 th Ave. S.W., Calgary, Alberta.

Notwithstanding staff shortage, satisfactory progress was made by Board staff in management planning and the preparation of the Conservation Unit Guides. The "Land Use Classification" which forms part of the guides also made satisfactory progress.

The Board wishes to express its appreciation to the Department of Forestry and Rural Development for their cooperation and work undertaken on the Conservation Area throughout the past year, as reported on herein.

Again the members of the Board acknowledge with gratitude the efficient and constant service given by the various staff members at all levels.

J.R.H. Hall, Chairman

A.T. Baker, Alberta Member

J.D.B. Harrison, Federal Member

No amendments were adopted affecting the

existing agreement between the Government of Canada and the Government of the Province of Alberta during the year under review.

Effective January 1, 1967, the following

Board positions were transferred to Civil Service Status in the Provincial Department of Lands and Forests and came under the purview of the Public Service Commission:

Forester (Grade III) (2)

Draftsman (Grade I)

Technical Assistant (Grade I)

Clerk-Stenographer (Grade III)

Clerk-Typist (Grade II)

The transfer of the above incumbents to the

Civil Service does not change the overall policy of the Board. All staff will be on loan and receive direction from the Eastern Rockies Forest Conservation Board. The status of the Chief Forester and Secretary will not change.

The forester in charge of the Board's water-

shed research program and the technical assistant resigned from the Board staff on November 22 and December 15, 1966, respectively. As replacements for these positions were not immediately available the Board's Watershed Research and Management Program were seriously handicapped.

The clerk-typist also resigned just prior

to the end of the fiscal year. A replacement by transfer from another Provincial Government Department is expected to be finalized shortly.

ADMINISTRATION

Four meetings of the Board were held during the 1966-67 fiscal year, three in Calgary and one during a field inspection at the Turtle Mountain Motel, Frank, Alberta. Minutes of all meetings were duly recorded and copies submitted to the Minister of the Federal Department of Forestry and Rural Development and the Minister of the Department of Lands and Forests of the Province of Alberta.

No amendments were enacted affecting the existing agreement between the Government of Canada and the Government of the Province of Alberta during the year under review.

Effective January 1, 1967, the following Board positions were transferred to Civil Service Status in the Provincial Department of Lands and Forests and came under the purview of the Public Service Commissioner:

- Foresters (Grade III) (2)
- Draftsman (Grade I)
- Technical Assistant (Grade I)
- Clerk-Stenographer (Grade III)
- Clerk-Typist (Grade II)

The transfer of the above incumbents to the Civil Service does not change the overall policy of the Board. All staff will be on loan and receive direction from the Eastern Rockies Forest Conservation Board. The status of the Chief Forester and Secretary was not changed.

The forester in charge of the Board's watershed research program and the technical assistant resigned from the Board staff on November 22 and December 15, 1966, respectively. As replacements for these positions were not immediately available the Board's Watershed Research and Management Programs were seriously handicapped.

The clerk-typist also resigned just prior to the end of the fiscal year. A replacement by transfer from another Provincial Government Department is expected to be finalized shortly.

In addition to the permanent staff three forestry students were engaged during the summer to assist with the field work and studies related to watershed management and research.

The permanent staff of the Alberta Forest Service assigned to the administration and protection of the Conservation Area numbered 80, together with 32 lookoutmen who are employed on a seasonal basis. In addition some 80 persons were engaged on a temporary basis on road construction and maintenance, stand-by fire duty, forest management, campground clean-up and related duties. The foregoing are under the jurisdiction of the Director of Forestry.

A summary showing the allocation of the Alberta Forest Service staff is appended hereto. (Appendix "A").

WATERSHED MANAGEMENT PLANNING

CONSERVATION UNIT GUIDES

The major effort in management planning continued to be by way of watershed condition survey, analysis of the watershed data and the subsequent writing of the guides. During the year the guide for one of the larger conservation units, B2 - Kananaskis-Highwood, was published. This completes the guides for the Conservation Area south of the Bow River.

Watershed Damage and Condition: An appraisal of watershed condition and the location of damage to the watershed through current or past use forms part of the survey which precedes the writing of the guides. During the summer of 1966 the field crew surveyed four conservation units on the Ghost, Little Red and North Saskatchewan Rivers, and on the Fallen-timber, Burnt Timber and Prairie Creeks.

Damage was mapped and is being incorporated into the conservation guides for each unit as well as into separate reports outlining the damage. These reports are supplied to the Alberta Forest Service as an aid in carrying out the restoration of good watershed condition.

Each sub-basin is rated as to existing watershed condition as well as to damage hazard. This information appears in the guides and is meant to assist in the planning of the management of each of the units by the Forest Service.

Watershed damage maps have now been supplied for all of the Conservation Area south of the Bow River and in the Red Deer River valley and restoration work has begun on those same watersheds. Watershed condition and hazard ratings have been supplied for the same areas.

Land Use Classification: As part of the guides the land within each conservation unit has been classified as to its present or potential best use. During the past year a new sub-class was added to meet the needs of recreational planning in a unit where this use is especially important.

The land classification has been based upon

geography and physiography. The three major zones are: the Headwaters Zone encompassing the high country which yields most of the water, the Intermediate Zone where multiple forest use has importance along with water production, and the Valley Zone where various uses become intensified and where the protection of water quality and avoidance of erosion become major concerns. Within these zones are special use zones such as the Water Margin, Travel and Geophysical Development Zones. To these were added three recreational use classes: (1) Development Zone, where the use is restricted to recreation and commercial development is allowed; (2) Wilderness Zone, where a wild, unchanged atmosphere allows outdoor recreation such as hiking, trail riding, mountain climbing, ski-touring and such activities; and (3) Multiple-Use Zone, where extensive outdoor recreation such as hunting, fishing, packing, camping, etc., are the major use but where lumbering, mining and other industries operate.

This classification has been completed for all land covered by the guides. It serves as a basis for preliminary planning and for a more detailed classification which will be made as planning progresses.

Management Reports: A fund of information useful to watershed land management has accumulated over the years as a result of investigations by Board staff. It has served a good purpose in guiding the Board's activities but has not been published so as to be easily available to others.

It was decided to prepare the information in a series of reports which may be useful to land managers, especially the Alberta Forest Service. A format and masthead was decided upon for the series.

The first publication, "Erosion Control on Mountain Range Land", appeared in March 1967. It reports a project begun in 1950 and culminated in 1966 in which methods of checking erosion on range land and the spreading of runoff reduce overland flow. Recommendations were made for restoring watershed condition to range land where erosion has begun and for improving watershed by decreasing overland flow.

Copies of this report are available from the Secretary of the Eastern Rockies Forest Conservation Board.

MANAGEMENT BY THE ALBERTA FOREST SERVICE

A summary of the activities of the Alberta Forest Service in the Conservation Area is outlined hereunder:

FOREST OPERATIONS

Timber Management: The "Quota System" of timber disposal has been implemented in the Province. Management units have been established in the Conservation Area, as well as in other forests of the Province, and allowable annual cuts have been established for each unit. In accordance with the sustained yield principle, production in quantities of timber harvested are controlled and watershed values are safeguarded.

The demand for round timber within the Conservation Area has increased considerably in the past year. Existing quotas for round timber will be converted from lineal feet to cubic feet to effect a more realistic method of measurement. It is expected that levels of utilization will improve appreciably over the next few years, and production from the Conservation Area will increase to its sustained yield capacity.

One basic element of the Quota System of timber disposal introduced effective May 1, 1966, is the issuance of timber to quota holders at an appraised rate of dues rather than by competitive auction. In the past fiscal year the timber appraisal system to be used has been finalized and approved. With the consent of the Alberta Forest Products Association, appraised rates are now being established for all active quota licenses in Alberta, including the Conservation Area.

Silvicultural projects completed by the Alberta Forest Service within the Conservation Area during 1966-67 are outlined below:

<u>Project</u>	<u>Total</u>
Land Scarified	1,900 acres
Land Seeded	601 acres
Planting	222,250 seedlings
Thinning	570 acres
Cone Collection	801 bushels

GRAZING

The annual grazing report is a summary compiled from information submitted by the Forest Superintendents of the Crowsnest, Bow River and Clearwater-Rocky Forests and from the Forest Management Branch, Alberta Forest Service.

The number of livestock (cattle, horses and sheep) grazed under permit in the Conservation Area decreased by 0.34 per cent only, but the actual use was down by 4.3 per cent. The actual use was 84,466 animal unit months during 1966 and this was mainly due to shifting the entry date to June 15 wherever possible. During the year 301 grazing permits were issued, which is six less than last year's number.

A summary of domestic animals grazed under permit as compared with the previous year is shown in Appendix "B".

Satisfactory progress was made on the range survey program. Nine range allotments in the Crowsnest Forest were re-surveyed. Four exclosures (8 transect clusters) were read.

The general condition of the range in all the three forests was fairly satisfactory. Holbrook and Nordegg Range Allotments were not used during 1966. Seed production of native grasses was very good.

Seven Texas gates were installed. Drift fences were built on six locations.

Weed control measures were continued at Sibbald Flats in Jumpingpound Range Allotment.

The past year (1966) was exceptionally good for seed production of all native grasses. Rough fescue seed was collected in the Crowsnest and Bow River Forests. As a result, about 50 pounds of clean seed was obtained in Blairmore and 1,000 pounds in Calgary.

Arrangements were made to distribute the seed to the different forests, research stations and private ranchers for trial purposes.

Cooperation between stockmen and forestry personnel continued to be good. Forest officers attended the meetings of

the various associations. Range management plans and decisions were fully discussed and explained to the members of these associations.

Glacier Creek and Sentry-York Allotments in the Crowsnest Forest continued to be closed to grazing. Wherever competition is noted in game winter ranges, the permittees are asked to avoid those areas and not to salt them. There is the perennial problem of increasing elk population in Bob Creek, Upper Spring and Lower Spring Creek Allotments. The Director of Fish and Wildlife has been requested to check the increase of elk population. The problem is still under study.

Ya-Ha-Tinda Ranch, Eagle Creek Watershed and the whole of Kananaskis District continued to be closed to grazing in the Bow River Forest.

White Goat and Siffleur wilderness areas, and Forty-Mile and Kootenay Plains areas are closed to grazing. Wherever grazing is permitted in the Clearwater-Rocky Forest the stocking rate is reduced to 50 per cent of the grazing capacity.

The review of the system of transect clusters and exclosures was continued.

Educational and training programs for Forest Officers and Land Use Officers on range management principles were carried out. These have improved the understanding of the field staff in range management.

RECREATIONAL PLANNING

Emphasis on the recreational planning field within the Conservation Area over the past two years has been on re-planning and redeveloping the existing recreational areas in accordance with the high standards specified by the Forest Service in its Recreation Manual. Initially, this re-development program was started on those areas which are considered to have the best capabilities for re-development and expansion and which are the most popular.

Presently there are 76 recreational areas within the Conservation Area which are in some stage of development, all of which receive very heavy use, particularly on weekends during the summer months. Of these 76 areas, 14 have been re-evaluated and

re-planned with a user capacity rating placed on each area in terms of picnic units, tent units and trailer units. The program will continue with the aim of establishing a capacity rating for each site, thus protecting these aesthetic areas from abuse and overuse. When this program is finished a reliable figure on the number of recreational travellers which can be accommodated within the Conservation Area will be available.

The 14 recreational areas which have been re-planned and have received approval by the Eastern Rockies Forest Conservation Board to date are Ram Falls, Fish Lake, Upper Shunda Creek, Eau Claire, Cat Creek, Cataract Creek, Burnt Timber, Gooseberry Flat, Kananaskis Lakes, Beaver Flat, Spray Lakes, Red Deer River, Livingstone Falls and Racehorse.

In conjunction with the campground re-development program a recreational site plan for the Kananaskis Lakes area was prepared by the Forest Service and approved by the Board. This site plan permits the establishment of limited public service facilities at the lake commensurate with Board policy and includes a store-service station site, boat rental facilities and a horse trail ride concession.

For winter recreationists, a ski development in the Castle River area was approved by the Board and is being developed and operated by private enterprise.

Approval in principle was given to a proposed ski resort in the Kananaskis area, but pending the submission of more information by the developers, the Department did not authorize the commencement of actual construction.

A commercial site was selected on the David Thompson Highway and approved by all agencies concerned. Submissions from prospective developers are to be invited.

Planning for a third wilderness area was finalized this year and the Ghost River Wilderness Area, comprising 37,850 acres, was established by the Provincial Government 65 miles northwest of Calgary, upon the recommendation of the Board and the Forest Service. The other two wilderness areas are the Siffleur and White Goat established in previous years.

Expenditure by the Forest Service on recreational development within the Conservation Area has increased considerably during the past few years and will undoubtedly continue to increase in order to carry out the planning proposed for this significant recreational area.

A position for a recreational officer has been established by the Alberta Forest Service for the Bow River Forest, and other positions are planned for the future in other Forests.

WATERSHED RESTORATION

An active program of watershed restoration is being carried out by the Alberta Forest Service in the Conservation Area. This is an action program to restore good watershed condition where damage has occurred as a result of exploitation for use of the natural resources.

A watershed inventory conducted by the Board staff locates damaged areas and recommendations for restorative treatment are outlined in the Conservation Unit Guides which is followed up by the Alberta Forest Service program mentioned above.

The work is carried out under the supervision of the Forest Superintendents with some direction from the Management Branch in Edmonton. It includes a variety of projects such as: establishing a vegetative cover by seeding to grass and fertilizing of areas damaged by overgrazing and saltgrounds; restoration of seismic lines, oil well and sawmill sites, and logging trails; cross-ditching, back-sloping and culvert installation on roads, and stabilizing of streambanks damaged by floods by the use of steel jacks.

FOREST AND WATERSHED RESEARCH

In the Memorandum of Agreement of the Eastern Rocky Mountain Forest Conservation Act the Board is empowered "to make arrangements with other agencies for the undertaking of research and other scientific investigations". In line with this policy the help of several Federal and Provincial agencies has been obtained and research investigations are being carried out in several fields. The work carried out by Board staff and cooperating agencies during the year under review is reported below.

Forest Research

The Board continued to receive generous support and assistance from the Department of Forestry and Rural Development by way of research, which supplies information and guidance. Besides their work in forest hydrology, which is part of the cooperative research program and reported elsewhere under "Watershed Research", a report of the activities of the Department which applies to the Board's program is briefly outlined hereunder:

Silviculture and Ecology: Investigations were conducted chiefly in the Crowsnest and Bow River Forests. Second-year results of special planting trials are very discouraging. Average survival of spruce and lodgepole pine is approximately 25 per cent and Douglas fir only 50 per cent. Work is continuing to solve this problem.

Spacing and thinning studies were initiated in overstocked and stagnating 25-year-old lodgepole pine in the Clearwater Forest. Treatment includes spacing of 200, 400, 800, 1,600 and 3,200 stems per acre on three different sites.

Insect and Disease Conditions: An assessment of forest insects and diseases in the Conservation Area is conducted annually as part of a general survey of the Alberta Region. Research is conducted in Calgary, Kananaskis Forest Experiment Station, and Mount Eisenhower Field Station in Banff National Park.

Spectacular outbreaks of the large aspen Tortrix and the aspen leaf miner occurred in patches of aspen throughout the southern parts of the foothills. Although both insects cause pronounced defoliation they are not serious pests because aspen normally

can withstand repeated defoliation. Nevertheless, experimental control tests are scheduled for 1967 against the aspen Tortrix to protect trees of high aesthetic value in recreation areas.

The spruce budworm caused light defoliation in the Saskatchewan River valley near Banff National Park, and low populations of bark beetle (*Dendroctonus obesus*) were detected in the upper watershed area of Racehorse Creek. Although populations of these insects are quite low at the present, both species are capable of causing widespread mortality of spruce.

The most significant forest diseases present in the area are shoestring root rot of conifers, stem cankers of pine, dwarf mistletoe of pine, and needle rusts of spruce. The first three diseases are perennial types in that infections usually remain with the host throughout the remainder of its life. The survey revealed stem canker of pine to be more prevalent in the Chungo Creek area than was previously reported, and several new infections of dwarf mistletoe were noted in the area north of the Bow River. Investigations are in progress to ascertain damage and to develop suitable control procedures. Needle rusts of spruce occur sporadically, being favored by prolonged periods of cool wet weather. During 1966 the rusts caused extensive discolouration of spruce foliage in many areas north of the Bow River but this is not considered serious.

"Red-belt" of conifers was prevalent between the North Saskatchewan River and Waterton Lakes National Park. This condition is believed to be caused by warm, dry winter winds which deplete the moisture content of the tree and cause the foliage to die. Repeated damage can result in the death of the trees; some 1,965 buds were killed prohibiting growth during 1966. These areas will be examined in 1967 to determine if adventitious budding is sufficient for recovery.

Further information on specific insects and diseases may be obtained from the "Annual Report of the Forest Insect and Disease Survey" and the "Annual District Reports" which are available from the Forest Research Laboratory, Department of Forestry and Rural Development, 132-9th Ave. S.W., Calgary, Alberta.

Forest Management Services: Areas in the Clearwater Forest were included in an assessment of provincial and industrial reforestation to examine the efficacy of methods and provide for large-scale trials of recommended

techniques. A new forest management plan will prepare the area for maximum use as a research and demonstration forest for the sub-alpine region. Plans are being prepared in cooperation with the Alberta Forest Service to assess mechanical thinning of lodgepole pine in the Bow River Forest.

Watershed Research

COOPERATIVE RESEARCH PROGRAM

The work of this program, which got under way in 1963, has made substantial progress during the past year. Twelve agencies of the Governments of Canada and Alberta continue to participate actively in the program, the ultimate purpose of which is the improvement of watershed management by determining and testing methods for improving, or at least maintaining, the yield of good quality water from the rivers having their source on the east slopes of the Rocky Mountains in the Conservation Area under the jurisdiction of the Board.

The work carried out during 1966 was mostly a continuation of studies and undertakings reported in the Third Annual Report of the Technical Coordinating Committee, except that on the lodgepole pine basin. Work is progressing towards management experimentation in Marmot and Streeter Basins, but more time will be required to reach a satisfactory degree of correlation between the different sub-basins. Knowledge acquired from the meteorological networks, the stream gauging and associated studies indicates the kind of land treatment that may improve watershed values.

Related studies into water-soil-plant relationships are under way to assist in the understanding of the water balance on mountain watersheds.

Gauged Basins: Deer Creek, a gauged basin of the lodgepole pine type, became the third major research basin in the East Slopes Watershed Research Program.

The objectives of this new project are similar to those of Marmot Creek and Streeter Basins (reported on in the Board's Annual Report for the fiscal year 1964-65), that is, to provide land managers with information which will aid them in improving watershed values while utilizing other natural resources. It is to initiate research into the effects

of commercial harvesting of mature lodgepole pine forests on water yield, quality and regime. The lodgepole pine in the Conservation Area is likely to be utilized for pulpwood, with effects upon watershed values not known at present.

Research methods will follow the same general pattern as those in Marmot Creek and Streeter Basins, any differences being in emphasis on particular studies and application of results.

Forest Hydrology by the Department of Forestry: The Federal Department of Forestry and Rural Development continued as a member of the inter-agency East Slopes (Alberta) Watershed Research Program. Staff included five research officers in continuing positions.

The first phase of a study to determine the hydrologic characteristics of litter in the sprucefir vegetation was completed in uncut and partially cut forests on north, south and east aspects. Also, snow accumulation and melt patterns of similar vegetation under uncut, clearcut and partially cut forest conditions were determined. The two studies are being expanded as a result of the preliminary analyses.

Infiltration studies of vegetation subtypes in the aspen forest and associated grassland were extended in 1966 to areas from which aspen has been cleared recently. The study is to determine changes in infiltration capacities as a result of modifications in vegetation cover and subsequent use.

Forest hydrology research in the lodgepole pine forests is just starting. Preliminary work on developing qualitative management guidelines based mainly on reconnaissance and research results was undertaken. The guidelines are aimed to minimize erosion and sediment production with timber harvesting operations. Plans call for studies of specific hydrologic processes to improve water yield, quality and regimen.

Studies of consumptive use of water in some of the major vegetation types continued. Radioactive techniques of measuring soil moisture are used in the lodgepole pine forests, whereas Colman fibreglas units are providing the data for spruce-fir vegetation. Soil moisture consumptive use in the aspen forest, willow-birch shrub and associated grassland was also started using gravimetric samples periodically through the major root zone. The aim is to assess the

commercial harvesting of mature lodgepole pine forests on water yield, quality and regime. The lodgepole pine is the Conservation Area is likely to be utilized for pulpwood, with effects upon watershed values known at present.

Research methods will follow the same general pattern as those in Mount Creek and Stream Basin, any differences being in emphasis on particular studies and application of results.

Forest Hydrology by the Department of Forestry, The Federal Department of Forestry and Rural Development continues as a member of the Interagency East Slope/Alberta Watershed Research Program. Staff included research officers in continuing positions.

The first phase of a study to determine the hydrologic characteristics of litter in the spruce vegetation was completed in uncut and partially cut forests on north, south and east aspects. Snow accumulation and melt patterns of similar vegetation under various climatic and partially cut forest conditions were determined. The studies are being expanded as a result of the preliminary analyses.

Infiltration studies of vegetation subtypes in open forest and associated grassland were extended in 1967 to areas in which open has been cleared recently. The study is to determine water infiltration capacities as a result of modifications in vegetation cover and subsequent use.

Forest hydrology research in the lodgepole forests is just starting. Preliminary work on developing qualitative management guidelines based mainly on reconnaissance and research was undertaken. The guidelines are aimed to minimize erosion and sediment production with timber harvesting operations. Plans call for studies of specific hydrologic processes to improve water yield, quality and regime.

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inherent potential of various vegetation types for any possible saving in water use and improve vegetation manipulation techniques.

Climatological Network: The initially planned network was completed in 1966 and now covers the headwaters of the Saskatchewan River from (and including) Waterton National Park in the south, through the Conservation Area and Banff National Park to the Brazeau River in the north.

Data on total precipitation, as well as proportion of snow and rain, are being fed in from many locations. Total water input for a basin can now be estimated for both management and research purposes.

The data reveal great differences in precipitation from different localities. For example, a station located on the Kootenay Plains on the Upper North Saskatchewan River reports a mean annual precipitation of 11.5 inches, whereas the Castle Ranger Station reports 27.6 inches. Both stations are in interior valleys at approximately 4,500 feet elevation. Variation in the proportion of snow to rain is also indicated by data from the northern and southern extremities of the area. At Brown Creek in the Brazeau River drainage snow makes up only 37 per cent of the total precipitation, whereas in the area of West Castle Station snow accounts for 70 per cent. Both stations are at 5,000 feet elevation.

The network was planned and established by a sub-committee of the Technical Coordinating Committee known as the "Climatological Network Committee", and its success was largely due to the cooperation of all agencies concerned.

Some one hundred storage gauges established by the Eastern Rockies Forest Conservation Board more than a decade ago became part of the network and twelve of the fire-weather stations operated by the Alberta Forest Service at Ranger Headquarters were also incorporated into the network. The Parks Branch in Banff and Waterton Lakes National Park have given similar cooperation. The Department of Forestry and Rural Development has given valuable assistance at the Kananaskis Forest Experiment Station and the Meteorological Branch, Department of Transport, have supplied the additional instrumentation needed and have played a leading role in the designing of the network.

The network now covers the entire foothills and mountain watershed of the Saskatchewan River. It is divided into

four zones with first-, second - and third-order stations in each. Second-order stations are normal stations where temperature and precipitation (including snow) are measured. The first-order stations pay more attention to continuity of records and measure other parameters such as wind and sunshine. The third-order stations are storage precipitation gauges.

Zone "A" covers the headwaters of the North Saskatchewan River. Three first-order stations are located at Rocky Mountain House in the outer foothills, Shunda Ranger Station inside the front range, and at Saskatchewan Crossing in an interior valley. Three second-order stations are at forest ranger stations and 26 storage gauges are spread over the Clearwater Forest at various elevations.

Zone "B" covers the headwaters of Red Deer and Bow River south to (but not including) the Highwood River. First-order stations are at Banff, Red Deer Ranger Station, Sunshine Village (Banff National Park), the Highwood Summit and the Kananaskis Forest Experiment Station. Second-order stations are maintained at the Elbow and Kananaskis Ranger Stations (Alberta Forest Service) and at Lake Louise and Eisenhower Junction Warden Stations (Banff National Park). There are 33 storage gauges distributed over the Bow River Forest and two in Banff National Park.

Zone "C" covers the Headwaters of the Highwood, Northwest Branch of the Oldman and Crowsnest Rivers. There are two first-order stations at the Streeter Research Basin and Coleman with the Highwood Summit station serving both zones "B" and "C". Seven second-order stations are located at the forest ranger stations and 33 storage gauges are distributed over varying elevations.

Zone "D" includes the drainage basin of the Castle River and Waterton Lakes Park. Three first-order stations range from Pincher Creek to Waterton. The second-order station is located at Beaver Mines. Ten storage gauges are located in the Crowsnest Forest and two in Waterton Lakes Park.

Hydrometric Network: The network of stream gauges on the headwaters of the Saskatchewan River system serves both the cooperative watershed research program and watershed management. Much more data, on water yield from the mountains and foothills on the East Slopes are available than ever before. Although the measuring of streams in Canada is long established, an unwonted need for data on the flow from the upper headwaters of the

Saskatchewan arose with the beginning of work by the Eastern Rockies Forest Conservation Board. Because of lack of information, the Board requested additional stream gauges and purchased some 14 stage recorders in 1949 which the Water Resources Branch installed in additional stream gauges.

The Water Resources Branch continued to slowly expand the network over the next decade, but new impetus came with the establishment of the East Slopes (Alberta) Watershed Research Program and a consequent awareness of the importance of the water resource. To guide the watershed research program the Technical Coordinating Committee established a sub-committee to assess the adequacy of stream measuring on the East Slopes and to make recommendations. The Board staff was represented on this committee. A report, presented in 1963, suggested a need for more stream metering, especially on smaller streams where particular land management problems existed.

Last year the Inland Waters Branch of the Department of Energy, Mines and Resources (previously the Water Resources Branch) added 17 stations to the network. This brought the total of the regular hydrometric network of the East Slopes to 46. Besides these some 14 special stream and spring gauging stations have been established as an intensive study network in the two gauged basins (Marmot Creek and Streeter) of the cooperative watershed research program.

The hydrologic information from both the network and the gauged basins has proven useful. The data from the network have been used, among other things, in making a hydrologic watershed analysis as part of the Conservation Unit Guides, prepared by the Board staff for the use of the Alberta Forest Service. The Board appreciates having this information available for its planning program and seeing the watershed research program furthered through its use, and expresses its gratitude to those agencies represented on the Hydrometric Network Sub-committee and especially the Inland Waters Branch who establish all stream metering stations.

Snow Accumulation and Melt Studies: A study project was set up to measure snow accumulation and melt in cut-over and uncut spruce-fir forest on north, south and east aspects. The preliminary study involving two years' work is now completed. It was reported at the Western Snow Conference, 1966. The next phase of this study proposes to establish a 50-acre block with cuts designed to give maximum snow accumulation and delay of snowmelt.

Qualitative Watershed Management Guidelines: A project with the short-term objective of developing qualitative management guidelines of direct benefit to forest managers of the lodgepole pine forest, with particular reference to erosion, sedimentation and water quality deterioration was begun. A broad reconnaissance of the proposed pulp area was completed.

Supporting Services: Board staff continued to supervise the maintaining of access leading to and within the established research basins. Negotiations with the Alberta Oil and Gas Conservation Board and Shell Canada Limited were undertaken to prevent the drilling of gas wells within the Deer Creek Basin. The staff also located a suitable access road to the basin and carried out a preliminary range inventory.

APPLIED
WATERSHED
MANAGEMENT
RESEARCH
E.R.F.C.B.

Snow Management and Timber Cutting: In co-operation with the Alberta Forest Service and Crestbrook Lumber Company the snow observations in the West Castle River basin have been extended into a study project. A strip cutting pattern, within the limits of economic

operation, has been marked on the ground in readiness for cutting and gathering of snow data. Snow accumulation, delay in snowmelt and yield of water will be observed as compared to uncut and clear-cut areas.

Snow Accumulation in the Alpine Zone: One year of observation has been taken on this study on Plateau Mountain, reported last year. Volume of snow accumulated by the snow fences, delay in melt and resulting run-off were observed and recorded.

FOREST PROTECTION

A total of 33 forest fires were recorded in the Conservation Area during the 1966 calendar year compared with 25 during the preceding year.

Area burned amounted to 33.1 acres compared with 10.64 acres during 1965.

Fires by Cause

	<u>Total Fires</u>		<u>Per Cent</u>	
	<u>1966</u>	<u>1965</u>	<u>1966</u>	<u>1965</u>
Lightning	8	11	24.2	44.0
Campers)	13	7	39.4	28.0
Smokers) Recreation		2		8.0
Public Projects	2	1	6.1	4.0
Industrial	4	Nil	12.1	0.0
Misc. Causes	<u>6</u>	<u>4</u>	<u>18.2</u>	<u>16.0</u>
	33	25	100%	100%

Fires by Forest

	<u>Number</u>	<u>Area Burned</u>
Crowsnest	5	1.25 acres
Bow River	14	31.85 acres
Clearwater	<u>14</u>	<u>Spot</u>
	33 fires	33.1 acres

There are a total of 25 producing and 24 non-operating, potential producing gas or oil wells in the Conservation Area; distributed as follows:

UTILIZATION OF RESOURCES

FOREST PRODUCTION

Statistics on timber licenses, timber permits and production of lumber and related products in the Conservation Area, as reported by the

Alberta Forest Service for the year under review, are noted hereunder:

Number of Timber Licenses offered for sale	none
--	------

Number of Timber Licenses granted to Quota Holders	5
--	---

Volume of Timber granted:	
Coniferous	28,214,000 f.b.m.

Number of Special Timber Permits issued	1
---	---

Number of Miscellaneous Timber Permits issued	288
---	-----

Number of Active Timber Licenses	66
----------------------------------	----

Production of Lumber and related products:

- Lumber (feet board measure)	43,307,006
- Railway ties (pieces)	26,527
- Round Timber (lineal feet)	6,363,573
- Lath (pieces)	642,650
- Slabs and Fuelwood (cords)	164
- Christmas Trees (number)	5,210
- Trees for Transplanting (number)	1,049

NATURAL GAS AND OIL DEVELOPMENT

There are a total of 25 producing and 24 non-operating, potential producing gas or oil wells in the Conservation Area, distributed as follows:

Crowsnest Forest: Twenty-five producing and seven non-operating gas wells.

Bow River Forest: Ten non-operating gas wells.

Clearwater-Rocky Forest: Seven non-operating gas wells.

Companies involved are Texas Gulf Sulphur Company, Shell Canada Limited, Imperial Oil Enterprises Ltd., and Alberta Gas Trunk Line Company Limited.

The Department of Highways replaced the wooden structures across the South Fork River with a 100-foot steel span. In the Crowsnest Forest on the West Castle Road the erection of an 80-foot steel span was completed. In the Bow River Forest three steel spans totalling 200 feet were erected.

During the period July 1 to July 4, 1966, heavy rains fell causing mountain streams to overflow and seriously damage roads in the Clearwater Forest. A special warrant of \$20,000 was obtained to institute repairs to roads and bridges.

Airships: In the Jumpingpound District of the Bow River Forest one new airship measuring 3,000 feet by 150 feet was constructed.

CONSTRUCTION AND MAINTENANCE

Progress on new construction carried out by the Alberta Forest Service is reported hereunder:

Roads: A total of 24,802 lineal feet of new grade was constructed. Nineteen thousand lineal feet of grade on the Northwest Branch of the Oldman River Road was improved.

Bridges: On the Forestry Trunk Road, four replacement bridges were constructed during the year; namely, Elk Creek Number 3, 28-foot precast; Elk Creek Number 4, 36-foot steel girders, wooden deck; Elk Creek Number 5, 28-foot precast; Elk Creek Number 6, 28-foot precast.

The Department of Highways replaced the wooden structure across the South Ram River with a 100-foot steel span. In the Crowsnest Forest on the West Castle Road the erection of an 80-foot steel span was completed. In the Bow River Forest three steel spans totalling 200 feet were erected.

During the period July 1 to July 4, 1966, heavy rains fell causing mountain streams to overflow and seriously damage roads in the Clearwater Forest. A special warrant of \$20,000 was obtained to institute repairs to roads and bridges.

Airstrips: In the Jumpingpound District of the Bow River Forest one new airstrip measuring 3,000 feet by 150 feet was constructed.

ACCOUNTING

The statements included in this section of the report reflect the revenue derived by the Alberta Forest Service from surface rights in the Conservation Area and expenditures by the Board and the Province for the maintenance and administration of the Area.

REVENUE Revenue from surface rights amounted to \$316,443.89, a decrease of \$112,073.22 from the previous year. Details of revenues are summarized hereunder:

	<u>1965-66</u>	<u>1966-67</u>
Grazing Permits, Taxes and Revenue Permits	63,552.86	63,763.98
Hay Permits, Fees, Dues, Etc.	26.00	---
Miscellaneous Leases	1,621.69	2,502.29
Sundry Revenue	132.00	338.52
Timber Permits	12,375.50	8,905.50
Special Timber Permits	95.35	271.36
Timber Fees, Rental, Etc.	17,581.43	14,111.07
Timber Dues	332,136.98	224,678.37
Right-of-Entry	995.30	1,872.80
	<u>\$428,517.11</u>	<u>\$316,443.89</u>

EXPENDITURE Operating expenses of the Board amounted to \$71,795.55 provided by the Province of Alberta under vote 1819 as detailed hereunder:

Utilities - Telephone	6.00	6.00
Salaries (Civil Servants)	6,253.25	8,253.25
Salaries and Wages (Board Staff)	52,831.91	52,831.91
	<u>\$69,562.02</u>	<u>\$71,795.55</u>

A current account is maintained with the Royal Bank of Canada, Calgary, Alberta, from which the Board disburses its administrative expense. All expenditures by the Board are audited monthly by the

	<u>General Administrative</u>	<u>Watershed Research</u>	<u>Total Expenditure</u>
Advertising	\$ 198.44	\$ --	\$ 198.44
Mobile Equipment- Operation	1,539.46	591.80	2,131.26
Contracts and Agreements	--	78.00	78.00
Fees and Commissions	1,047.50	10.00	1,057.50
Freight, Express and Cartage	12.36	9.06	21.42
Furnishings, Equip- ment and Tools	1,458.66	--	1,458.66
Interest - Bank	3.00	--	3.00
Materials and Supplies - Administrative and Operating	2,107.20	75.90	2,183.10
Construction and Maintenance	53.85	130.91	184.76
Postage	117.00	--	117.00
Rentals of Equipment	360.00	411.40	771.40
Repairs to Equipment and Furnishings	14.64	7.20	21.84
Repair of Office Machines	94.01	--	94.01
Contributions to Canada Pension Plan	475.86	--	475.86
Telephone and Telegraph	510.20	--	510.20
Travelling Expenses	2,324.56	919.26	3,243.82
Tuition	100.00	--	100.00
Unemployment Insurance	54.12	--	54.12
Utilities - Propane	6.00	--	6.00
Salaries (Civil Servants)	6,253.25	--	6,253.25
Salaries and Wages (Board Staff)	52,831.91	--	52,831.91
	<u>\$69,562.02</u>	<u>\$2,233.53</u>	<u>\$71,795.55</u>

A current account is maintained with the Royal Bank of Canada, Calgary, Alberta, from which the Board disburses its administrative expense. All expenditures by the Board are audited monthly by the

Provincial Auditor.

Expenditure for the maintenance and administration of the Conservation Area, including the expenses of the Board, provided by the Province of Alberta in accordance with Section 2(a) (11) of the Memorandum of Agreement between the Government of Canada and the Government of the Province of Alberta amounted to \$1,313,795.41 for the fiscal year under review.

For financial details see Appendix "C", Statements "A", "B", and "C".

WORKMEN'S
COMPENSATION

The Board's Deposit of \$5,000.00 with the Alberta Workmen's Compensation Board earned interest of \$219.57 less administrative expense and reserve for rehabilitation and enhanced disabilities of \$81.00, leaving a net credit to Proprietary Equity of \$138.57.

ESTIMATES
FISCAL YEAR
1967-68

Estimates for the administration of the Board for the fiscal year 1967-68 in the amount of \$84,100.00 were approved by the Legislature of the Province of Alberta under Appropriation No. 1819.

DISTRIBUTION OF ALBERTA FOREST SERVICE PERSONNEL

FISCAL YEAR 1966-67

Permanent Staff	Crowsnest Forest	Bow River Forest	Clearwater- Rocky Forest	Totals
Forest Superintendents	1	1	1	3
Fire Control Officers	1	1	1	3
Foresters	1	1	1	3
Assistant Fire Control Officers	1	1	1	3
Forest Management Technicians	-	-	1	1
District Rangers	5	8	8	21
Land Use Officers	1	1	1	3
Assistant Rangers	4	9	6	19
Clerks	1	1	2	4
Stenographers and Typists	1	2	2	5
Radio Operators	1	1	1	3
Carpenters	-	1	1	2
Road Foremen	-	-	1	1
Warehousemen	1	1	1	3
Automotive Equipment Operators	-	1	1	2
Lookoutmen - Permanent	1	1	2	4
	19	30	31	80
	7	11	14	32
Lookoutmen - Seasonal	26	41	45	112

GRAZING 1966

The number of domestic animals grazed under permit as compared with the previous year is given below.

	Crowsnest Forest		Bow River Forest		Clearwater-Rocky Forest		Forest Reserve Total	
	1965	1966	1965	1966	1965	1966	1965	1966
Cattle	14,467	14,391	8,953	9,509	1,341	960	24,761	24,860
Sheep	975	1,000	--	--	--	--	975	1,000
Horses	--	--	307	289	162	147	469	436
Total	15,442	15,391	9,260	9,798	1,503	1,107	26,205	26,296
Actual Use in A.U.M. *	49,291	46,394	31,850	33,700	7,123	4,372	88,264	84,466
No. of Permits	189	187	93	91	25	23	307	301
No. of Allotments	47	47	39	39	14	14	100	100
Revenue	\$36,485.40	\$34,314.50	\$24,063.06	\$24,367.30	\$4,107.34	\$3,051.64	\$64,655.80	\$61,889.89 **

* A.U.M. - Animal Unit Month
The amount of forage required by one animal unit, which is equivalent to a mature cow and calf at foot, for one month.

** Total Includes \$156.45 collected as Trespass Dues.

GOVERNMENT OF THE PROVINCE OF ALBERTA
OFFICE OF THE PROVINCIAL AUDITOR

EDMONTON, June 8, 1967

Eastern Rockies Forest Conservation Board
CALGARY, Alberta

I have audited the books and records of the Eastern Rockies Forest Conservation Board, maintained by the Department of Lands and Forests, Government of the Province of Alberta, for the year ended March 31, 1967, and submit the following statements herewith:

<u>Statement</u>	<u>Particulars</u>
A.	Balance Sheet
B.	Statement of Maintenance Expenditure
C.	Statement of Government of Canada and Government of the Province of Alberta Equity

Total capital expenditures from inception to March 31, 1955, amounting to \$6,278,906.10 were made from funds provided by the Government of Canada (as authorized under Section 8 (a) of the Memorandum of Agreement) for the location and construction of forest improvements, the making of a forest inventory, reforestation, and such other works and services as the Board considered necessary in that area of the East Slope of the Rocky Mountains forming part of the watershed of the Saskatchewan River, as more definitely described in the Appendix to the Act. The total expenditure was not to exceed \$6,300,000.00 during the seven years ended March 31, 1955.

I certify that, in my opinion, the attached Balance Sheet is properly drawn up so as to show the true financial position of the Eastern Rockies Forest Conservation Board as at March 31, 1967, according to the information and explanations given to me and as shown by the records of the Board and the accompanying statements correctly set forth the result of transactions for the year ended at that date.

F. C. A.
Provincial Auditor.

Statement A

EASTERN ROCKIES FOREST CONSERVATION BOARD

BALANCE SHEET

AS AT MARCH 31, 1967

ASSETS

Workmen's Compensation Board deposit	\$ 5,138.57
Value of loose tools and equipment transferred to the Province of Alberta as at April 1, 1959	173,496.38
Capital improvements and works	<u>5,716,615.20</u>
	<u>\$5,895,250.15</u>

LIABILITIES

Government of Canada and Government of the Province of Alberta, equity as per Statement C	<u>\$5,895,250.15</u>
--	-----------------------

Note: Section 20 of the Memorandum of Agreement set forth in the Schedules to Chapter 59, Statutes of Canada, 1947, and Chapter 20, Statutes of Alberta, 1948, and Amendment Act, 1957, provides that upon termination of the Agreement:

- (a) All improvements or works resulting from the carrying out of the programs of the Board shall belong to the Province.
- (b) All other property acquired by the Board shall belong to the Province.

This is the Balance Sheet referred to in my report of June 8, 1967, addressed to the Eastern Rockies Forest Conservation Board.

F. C. A.
Provincial Auditor.

Statement B

EASTERN ROCKIES FOREST CONSERVATION BOARD

STATEMENT OF MAINTENANCE EXPENDITURE

FOR THE YEAR ENDED MARCH 31, 1967

Maintenance expenses:

Salaries	\$526,811.00
Wages	254,397.91
Equipment and motor vehicle expense	129,809.85
Maintenance, material and operation expense	127,831.70
Rentals	113,980.26
Travelling	40,118.59
Administration and general expense	25,665.92
Heat, light and power	16,148.01
Freight, express and cartage	7,845.60
Telephone and telegraph	3,756.07
Postage	1,316.00
Honorarium	1,000.00
Pensions	475.86
Advertising	366.44

\$1,249,523.21

Automobiles, trucks and mobile equipment

57,195.08

Furnishings, equipment and tools

7,077.12

\$1,313,795.41

Provided by:

Appropriations 1815, 1819 and 1821

\$1,313,795.41

Note: The total amount expended by the Board was provided by the Government of the Province of Alberta in accordance with Section 2 (a) (ii) of the Memorandum of Agreement, dated June 17, 1953, between the Government of Canada and the Government of the Province of Alberta as set forth in the Schedules to Chapter 41, Statutes of Canada, 1952, and Chapter 36, Statutes of Alberta, 1953.

The remuneration and expenses of members of the Board were paid by the Governments of Canada and the Province of Alberta in accordance with Section 2 (b) (iii) of the Memorandum of Agreement. The amounts paid by the Province of Alberta, including the honorarium of \$1,000.00 to A. T. Baker, have been incorporated into the above statement.

Statement C

EASTERN ROCKIES FOREST CONSERVATION BOARD
STATEMENT OF GOVERNMENT OF CANADA AND GOVERNMENT
OF THE PROVINCE OF ALBERTA EQUITY
FOR THE YEAR ENDED MARCH 31, 1967

Balance as at April 1, 1966	\$ 5,895,224.10
Add:	
Workmen's Compensation Board deposit interest	138.57
	<hr/>
	\$ 5,895,362.67
Deduct:	
Workmen's Compensation Board interest remitted	112.52
	<hr/>
Government of Canada and Government of the Province of Alberta equity as at March 31, 1967	\$ 5,895,250.15
	<hr/> <hr/>

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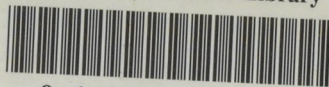
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